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Application Number	09/881,505
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First Named Inventor	Bipul Binit Sinha, et al.
Art Unit	2161
Examiner Name	LeRoux, Etienne Pierre
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ENCLOSURES *(Check all that apply)*

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  - [x] Fee Attached
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  - [ ] After Final
  - [ ] Affidavits/declaration(s)
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Gordon E. Nelson, Patent Attorney PC		
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(oracle01.016)

Applicant:	Bipul Binit Sinha et al.	**Paper No.:**	
Application No:	09/881,505	**Group Art Unit:**	2161
Filed:	6/14/01	**Examiner:**	LeRoux, Etienne Pierre

Title: *Two-stage commit with queryable caches*

Commissioner for Patents
Alexandria, VA 22313-1450

Appeal Brief under 37 C.F.R. 41.37

(1) Real party in interest

.The real party in interest is Oracle International Corporation, the assignee of record, which is a subsidiary of Oracle Corporation

(2) Related appeals and interferences

None

(3) Status of claims

Claim 1 has been canceled; the claims presently under examination are claims 2-31. All of claims 2-31 have been rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent 5,335,343, Lampson, et al., *Distributed transaction processing using two-phase commit protocol with presumed-commit without log force*, issued Aug. 2, 1994 (henceforth Lampson).

(4) Status of amendments

No amendments after final rejection have been made. The claims are as amended in Applicants' response of 10/27/2005.

(5) Summary of claimed subject matter

The independent claims in this application are claims 5, 8, 10, 11, 22, 24, 30, 31. All

are addressed to the same subject matter, namely a technique for optimizing protocols used in distributed systems to ensure that all of the components of a distributed system that are affected by a transaction remain consistent with regard to the transaction. A preferred embodiment of the invention is described beginning at page 15, line 14. FIG. 3 and page 15, line 14-17, line 10 describe describes one of these protocols, the well-known two-phase commit protocol; page 17, lines 11-24 describe a prior-art optimization of the two-phase commit protocol. As may be seen there, the protocols achieve consistency among the components that are affected by the transaction by ensuring that a transaction that changes the state of the affected components either changes the state of all of the affected components or changes the state of none of them. The later situation occurs if one or more of the components is unable to commit the transaction.

Each of the components affected by the transaction is either a *coordinator* or a *cohort* with regard to the protocol. The coordinator sends a *request commit* message to the cohorts which indicates to the cohorts that a state change resulting from a transaction is about to take place; each cohort replies to the *request commit* message with an *agree* message if the cohort can make the state change or an *abort* message if it cannot. If the coordinator receives *agree* messages from all of the cohorts, the coordinator sends a *commit* message to each of the cohorts and the cohorts respond to the *commit* message by making the state change and sending an *acknowledgement* message to the coordinator. When the coordinator has received *acknowledgment* messages from all of the cohorts, it makes the change itself. If the coordinator receives an *abort* message from any of the cohorts, it does not make the change itself and sends an *abort* message to each of the cohorts. The cohorts respond to the *abort* message by not making the change.

The optimization that is the subject matter of independent claims 5, 8, 10, 11, 22, 24, 30, and 31 takes advantage of the fact that a component of the distributed system may be read only with regard to the transaction. If it is, the transaction will not affect the component's state and the component need not participate in the protocol. Indeed, if the coordinator knows that a cohort is read only with regard to the transaction, it need not determine whether the cohort can make the state change. As is clear from the foregoing, what is needed is a way of making it possible for the coordinator to know

at the time it sends the request commit messages to the cohorts whether a cohort is read only with regard to the transaction.

The technique for doing this is set forth broadly in method form in claim 11, which reads as follows. Reference numbers refer to FIG. 4:

> **11.** A method practiced in a first component of a distributed system that exchanges messages (403) belonging to a transaction with one or more other components of the distributed system of optimizing a protocol, the protocol being employed by the first component and the other component in making the transaction, the first component being a coordinator for the protocol, and
>
> the method comprising the steps of:
>
> receiving an augmented one of the messages (401) from the other component, the other component having augmented the message by adding protocol state information (405) to the message, the protocol state information indicating a state of the other component that is relevant to the protocol;
>
> retaining the state of the other component indicated in the augmented message (413); and
>
> using the retained state to optimize the protocol.

In the two-phase commit protocol, which is a species of what is claimed above, the protocol state information is that the cohort is read only and the mechanism set forth in the claim for ensuring that the coordinator always knows whether a transaction is read-only with regard to a cohort is described at page 17, line 26-page 18, line 30. The cohorts *augment* the messages 403 belonging to the transaction with protocol state information 405 indicating a state of the cohort that is relevant to the protocol, in this case that the cohort is read only with respect to the transaction. The coordinator keeps track of the state for each cohort as shown at 413, updating a cohort's state as augmented messages 403 come in from the cohort. When it is time to change state, the coordinator can use the retained state for the cohorts to optimize the protocol that is performed when the state changes.

FIG. 5 is a flowchart for using augmented messages 403 indicating (407) whether a cohort is read only with regard to a transaction to optimize the two-phase commit protocol. The flowchart is described at page 19, lines 12-31. The claimed step of "receiving an augmented one of the messages is shown at 515; the step of "retaining the state" is shown at 517; the step of "using the retained state to optimize the

protocol" (here, the two-phase commit protocol) is shown at 519, 521, 527, and 529. If retained state 413 indicates that a cohort is read-only with regard to the transaction, the coordinator simply sends the cohort a 2-phase commit "abort" message and doesn't bother with the remainder of the 2-phase commit for that cohort.

The remaining independent claims are closely related to claim 11. Claim 11 is a generic method claim which claims the optimization technique from the point of view of the coordinator; claim 5 is a generic method claim which claims the optimization technique from the point of view of the cohort. The flowchart for the cohort is shown at FIG. 6 and described at page 20, lines 1-12. When a transaction message is to be sent to the coordinator (605), the cohort determines whether it is read only (607); if it is, it sets bit 407 to read only (621); otherwise, it sets bit 407 to not read only (623) and sends augmented message 401 with the set bit 407 to the coordinator (625).

Method claims 9 and 10 are addressed to the species of the generic methods that are represented by the optimization of the 2-phase commit protocol; claim 9 is directed to the optimized 2-phase commit protocol as claimed from the point of view of the coordinator; claim 10 is directed to the optimized 2-phase commit protocol as claimed from the point of view of the cohort.

Independent claims 22, 26, 30, and 31 are apparatus claims that are addressed to coordinators and cohorts which employ the technique to optimize protocols. Claim 22 is to a generic coordinator which employs the technique and claim 26 is to a generic cohort which does so; claim 30 is to a species of the coordinator which employs the technique to optimize the two-phase commit protocol and claim 31 is to a species of the cohort which employs the technique to optimize that protocol. FIGs. 4, 5, and 6 and the portions of the Specification beginning at page 17, line 26 in which these figures are discussed disclose the inventions of all of the independent claims. A discussion of generalizations of the optimization technique may be found beginning at page 21, line 6.

(6) Grounds of rejection to be reviewed on appeal

The only grounds of rejection currently in the application is the rejection of claims 2-31 under 35 U.S.C. 102(b) as anticipated by Lampson. It is this rejection which is to be reviewed on appeal.

(7) Argument

The issue

The legal requirement for a rejection of a claim under 35 U.S.C. 102(b) is that the reference upon which the rejection is based must disclose *all of the limitations* of the claim. See in this regard MPEP 2131 and the cases cited there. In this appeal, the issue between Applicants and Examiner comes down to this: does Lampson disclose *any* of the following limitations of Applicants' claim 11:

- the augmented message, which is set forth as follows at lines 8-12 of claim 11:

  > an augmented one of the messages (401) [belonging to a transaction]. . . the other component having augmented the message by adding protocol state information (405) to the message, the protocol state information indicating a state of the other component that is relevant to the protocol;

- retention of the state of the other component indicated in the augmented message by the coordinator; (claim 11, line 13) and

- use of the retained state to optimize a protocol (claim 11, line 14).

All of Applicants' independent claims include one or more of these limitations or limitations similar to these limitations.

The disclosure of Lampson

What Lampson discloses is a version of the prior-art optimization of the two-phase commit protocol described at page 17, lines 19-24 of Applicants' Specification. In this optimization, a cohort that is read only with respect to a transaction may respond to a *request commit* message with a *read only* message; when the coordinator receives the *read only* message from a cohort, the coordinator does not send that cohort a commit message.

Lampson's version of the optimization is shown in Lampson's FIG. 12 and described at col. 9, line 58-col. 10, line 6:

> Referring to FIG. 12, to take into account "read-only" transactions in a two-phase commit protocol, when a subordinate receives a prepare message (item 29), it first determines at item 80, by examining its log,

> whether or not it has done any updates to the database (i.e., whether "undo" or "redo" log records have been written). If not, then at item 81 it sends a "read" vote to the coordinator, releases its locks, and forgets the transaction, item 82. In this case, the subordinate writes no log records; it merely returns to idle state. As far as this subordinate process 26 is concerned, it does not matter whether the transaction ultimately gets aborted or committed. So this subordinate, who is now known to the coordinator as "read-only" does not need to be sent a "commit" or "abort" message by the coordinator.

As is made clear by FIG. 12, the subordinate (cohort) is "read only" with regard to the transaction if it has done no updates to its database as a result of the transaction. If the subordinate is read only when a "prepare" (request commit) message comes from the coordinator, it sends a "read" vote (read only message) to the coordinator and "forgets" the transaction. When the coordinator has received a "read" vote from a subordinate, it sends neither a commit nor an abort message to the subordinate.

Lampson's failure to disclose Applicants' "augmented message"

It is apparent from the foregoing description of Lampson's "read vote" that the cohort sends the "read vote" to the coordinator in the same way that it sends the "commit" vote or the "abort vote": when the coordinator has received all of the messages belonging to a transaction that is to be committed, the coordinator sends the cohorts the two phase commit protocol's "prepare" message. The cohorts respond to the "prepare" message with a "read" vote if they are read only with respect to the transaction, a "commit" vote if they are able to commit the transaction, or an "abort" vote if they are not able to commit the transaction.

The coordinator sends the "prepare" message only when it has received all of the messages belonging to the transaction; it receives the "read" vote only in response to the "prepare" message; consequently, the "read" vote *cannot* be part of a message belonging to a transaction and therefore *cannot* be Applicants' "augmented message", which as set forth in claim 11, is a *transaction message* which has been *augmented* by "adding protocol state information (405) to the message, the protocol state information indicating a state of the other component that is relevant to the protocol".

Lampson's failure to disclose all the limitations of claim 11

Because the "read vote" is not Applicant's "augmented message, Lampson also cannot and does not disclose *any* of the method steps of claim 11: the reference does not disclose "receiving an augmented one of the messages (401) from the other component", "retaining the state of the other component indicated in the augmented message", or "using the retained state to optimize the protocol". Since that is the case, Lampson cannot serve as a basis for a rejection of claim 11 under 35 U.S.C. 102.

Lampson and independent claims 5, 9, 10, 22, 26, 30, and 31

Claim 5

Claim 5 is a method claim that claims Applicants' optimization technique from the point of view of the cohort; it consequently includes the step of "augmenting a message of the transaction by adding protocol state information to the message, the protocol state information indicating the protocol state of the other component"; since Lampson does not disclose Applicants' augmented message, it cannot and does not disclose the above method step and consequently does not anticipate claim 5.

Claim 9

Claim 9 is a method claim that claims Applicants' optimization technique as it is practiced in the two-phase commit protocol from the point of view of the coordinator; it includes the step of "receiving a message of the transaction from the cohort, the message being augmented with state information indicating whether the transaction modifies the cohort's data"; this is of course Applicants' "augmented message" as it is specifically used to optimize the two-phase commit protocol; as with claim 11, because Lampson does not disclose the "augmented message", it can disclose none of the method steps of claim 9 and cannot anticipate the claim.

Claim 10

Claim 10 is a method claim that claims Applicants' optimization technique as it is practiced in the two-phase commit protocol from the point of view of the cohort; it includes the step of "augmenting a message that the cohort sends to the coordinator as part of the transaction with state information indicating whether the transaction will modify the cohort"; This is again Applicants' "augmented message" as it is specifically used to optimize the two-step commit protocol; because Lampson does not disclose the augmented message, it can neither disclose the foregoing method step

of claim 10 nor the limitation, "the coordinator sending a message of the commit protocol to the cohort as determined by the state information" and the claim is not anticipated by Lampson.

Claim 22

Claim 22 is to a coordinator that employs the optimization technique. The claim's limitations include the augmented message, retaining state information from the augmented message, and using the retained state information to optimize the protocol. Again, Lampson does not disclose the augmented message, the retention of state information from it, or the use of the state information to optimize the protocol, and the claim is consequently not anticipated by Lampson.

Claim 26

Claim 26 is to a cohort that employs the optimization technique. The limitations include the augmented message, sending the augmented message to the coordinator and the coordinating retaining the state information and using the retained state information to optimize the protocol. Lampson does not disclose these limitations, and consequently cannot anticipate the claim.

Claims 30 and 31

These claims are to a coordinator that employs the optimization technique to optimize the two-phase commit protocol and to a cohort that employs the optimization technique to do so. The limitations of both claims include the augmented message, retaining state from the augmented message, and the coordinator sending an abort message instead of the commit request message to the cohorts whose retained state indicates that the transaction does not modify the cohort's data. Lampson discloses none of these limitations and consequently cannot anticipate these claims.

Patentablility of dependent claims

Dependent claims 12-21

These are dependent Beauregard claims and are patentable to the extent that the claims that they refer to are patentable.

Dependent claims 4 and 8

These claims are patentable because they are dependent from patentable claims.

Dependent claims that are patentable in their own rights over Lampson

<u>Dependent claims 2, 6, 23, and 27</u>

The added limitations of these dependent claims further limit the retained state information that is retained from the augmented message, and are consequently patentable in their own rights over Lampson, which does not disclose such retained state information.

<u>Dependent claims 3, 7, 24, and 28</u>

The added limitations of these claims further limit the message sent by the coordinator when the retained state indicates that the transaction will modify data in the other component. Lampson neither discloses such retained state nor its use by the coordinator to determine whether to send an abort message instead of a commit message to a cohort, and the claims are thus patentable in their own rights over Lampson.

Rebuttal of Examiner's "inherency" argument with regard to Lampson

In Examiner's *Response to Arguments* at page 6 of the final Office action of 1/17/06, Examiner argues that "it is inherent in the disclosure of Lampson that a message must be augmented to include status information" and cites col. 28, lines 3-35 of Adams, et al., U.S. Patent Number 4,866,714 as an example of such "inherency". The first problem with this argument is that Applicants' claimed "augmented messages" must be "messages belonging to a transaction" (claim 11, line 2) and there is absolutely nothing "inherent" about augmenting a message belonging to a transaction by "adding protocol state information to the message" and then using the added protocol state information to optimize a protocol, as set forth in Applicants' claims. The second problem with the argument is that Adams discloses a system for burning in digital circuits. A PC has a sequential message interface that communicates with the digital circuits, and two of the bits of the message are status bits. The message always contains the status bits. Thus, even though the status bits are the last bits in the message to be written, the message is not "augmented" with the status bits in the manner that the transaction messages are augmented in Applicants' claims.

Conclusion

In the foregoing, Applicants have complied with the requirements of 37 C.F.R. 41.37 with regard to their brief and have demonstrated in the brief that Lampson does not anticipate any of Applicants' claims. That being the case, Examiner's rejections under 35 U.S.C. 102(b) cannot stand and Applicant respectfully requests that the Board of Appeals reverse Examiner with regard to all of his rejections and remand the application to Examiner for further processing as indicated by the reversals. The requisite fee for large entity of $500 for this appeal brief is attached. Please charge any additional fees required for this appeal or refund any overpayments to deposit account number 501315.

Respectfully submitted,

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on June 15, 2006
(Date)

Gordon E. Nelson, #30,093
Gordon E. Nelson

(8) Appendix of claims

Claim 1: Canceled

2. The method set forth in claim 11 wherein:

the protocol ensures that the results of the transaction are consistent in the components; and

in the step of receiving an augmented one of the messages, the protocol state information indicates whether the transaction will modify data in the other component.

3. The method set forth in claim 2 wherein:

the protocol being optimized is a two-phase commit protocol;

and

in the step of using the retained state to optimize the protocol the first component sends a message of the two-phase commit protocol that aborts the transaction to an other component when the other component's retained state indicates that the transaction does not modify the data in the other component.

4. The method set forth in claim 3 wherein:

the distributed system is a distributed database system and the components are database systems therein.

5. A method of ensuring that a first component of a distributed system that exchanges messages that belong to a transaction with one or more other components of the distributed system is additionally aware of a protocol state of an other

component, the protocol state being relevant to a protocol that is employed with the transaction, the first component being a coordinator for the protocol and the method comprising the steps practiced in the other component of:

determining the protocol state; and

augmenting a message of the transaction by adding protocol state information to the message, the protocol state information indicating the protocol state of the other component,

the first component using the protocol state to optimize the protocol.

6. The method set forth in claim 5 wherein:

the protocol state indicates whether the transaction will modify data in the other component.

7. The method set forth in claim 6 wherein:

the protocol being optimized by the first component is a two-phase commit protocol; and the other component receives an abort message of the two-phase commit protocol when the protocol state indicates that the transaction will not modify the data in the other component.

8. The method set forth in claim 7 wherein:

the distributed system is a distributed database system and the components are database systems therein.

9. A method of executing a two-phase commit protocol for a transaction, the transaction involving a coordinator and a cohort and

the method comprising the steps performed in the coordinator of:

receiving a message of the transaction from the cohort, the message being augmented with state information indicating whether the transaction modifies the cohort's data;

retaining the state information for the cohort; and

if the state information for the cohort indicates that the transaction does not modify the cohort's data, sending an abort message of the two-phase commit protocol to the cohort.

10. A method of executing a two-phase commit protocol for a transaction, the transaction involving a coordinator and a cohort and

the method comprising the steps performed in the cohort of:

augmenting a message that the cohort sends to the coordinator as part of the transaction with state information indicating whether the transaction will modify the cohort; and

responding to messages received from the coordinator as required by the commit protocol,

the coordinator sending a message of the commit protocol to the cohort as determined by the state information.

11. A method practiced in a first component of a distributed system that exchanges messages belonging to a transaction with one or more other components of the distributed system of optimizing a protocol, the protocol being employed by the first component and the other component in making the transaction, the first component being a coordinator for the protocol, and

the method comprising the steps of:

receiving an augmented one of the messages from the other component, the other component having augmented the message by adding protocol state information to the message, the protocol state information indicating a state of the other component that is relevant to the protocol;

retaining the state of the other component indicated in the augmented message; and

using the retained state to optimize the protocol.

12. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 11.

13. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 2.

14. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 3.

15. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 4.

16. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 5.

17. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 6.

18. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 7.

19. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 8.

20. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 9.

21. A data storage device, characterized in that: the data storage device contains code which, when executed by a processor, performs the method of claim 10.

22. A coordinator in a distributed system that coordinates a protocol employed with a transaction that exchanges messages with one or more other components of the distributed system,

the coordinator having the improvement comprising:

retained state information that retains state of an other component that is relevant to the protocol,

the coordinator receiving a message of the transaction from the other component which has been augmented with the state information, retaining the state information from the augmented message in the retained state information, and using the retained state information to optimize the protocol.

23. The coordinator set forth in claim 22 wherein:

the protocol ensures that the results of the transaction are consistent in the components; and

the retained state information for the other component indicates whether the transaction will modify data in the other component.

24. The coordinator set forth in claim 23 wherein:

the protocol being optimized is a two-phase commit protocol; and

the coordinator sends a message of the two-phase commit protocol that aborts the transaction to an other component when the other component's retained state indicates that the transaction does not modify the data in the other component.

25. The coordinator set forth in claim 24 wherein:

the distributed system is a distributed database system and the coordinator and the other component are database systems therein.

26. A cohort in a distributed system, the cohort being involved in a transaction which employs a protocol that is coordinated by a coordinator and exchanging messages of the transaction with the coordinator,

the cohort having the improvement comprising:

a message of the protocol that is augmented with state information indicating a state of the cohort which is relevant to the protocol,

the cohort sending the message to the coordinator and the coordinator retaining the state information and using the retained state information to optimize the protocol.

27. The cohort set forth in claim 26 wherein:

the protocol ensures that the results of the transaction are consistent in the components; and

the state information in the augmented message indicates whether the transaction will modify data in the cohort.

28. The cohort set forth in claim 27 wherein:

the protocol being optimized by the coordinator is a two-phase commit protocol; and

the coordinator sends a message of the two-phase commit protocol that aborts the transaction to the cohort when the retained state information for the cohort indicates that the transaction does not modify the data in the cohort.

29. The cohort set forth in claim 28 wherein:

the distributed system is a distributed database system and the cohort and coordinator are database systems therein.

30. A coordinator in a distributed system that coordinates a two-phase commit protocol employed with a transaction that involves one or more cohorts in the distributed system,

the coordinator having the improvement comprising:

retained state information that retains state of a cohort, the state indicating whether the transaction will modify the cohort's data,

the coordinator receiving a message of the transaction from the cohort which has been augmented with the state information, retaining the state information from the augmented message in the retained state information, and if the retained state information for the cohort indicates that the transaction does not modify the cohort's data, sending an abort message of the two-phase commit protocol to the cohort.

31. A cohort in a distributed system in which a coordinator in the distributed system coordinates a two-phase commit protocol employed with a transaction that involves the cohort,

the cohort having the improvement comprising:

a message of the transaction that is augmented with state information indicating whether the transaction will modify the cohort's data,

the cohort sending the message to the coordinator and the coordinator retaining the state information and if the retained state information for the cohort indicates that the transaction does not modify the cohort's data, sending an abort message of the two-phase commit protocol to the cohort.

(9) Evidence appendix

None.

(10) Related proceedings appendix

(None)

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FEE TRANSMITTAL
For FY 2006

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($) 500

Complete if Known	
Application Number	09/881,505
Filing Date	6/14/2001
First Named Inventor	Bipul Binit Sinha, et al.
Examiner Name	LeRoux, Etienne Pierre
Art Unit	2161
Attorney Docket No.	oracle01.016

METHOD OF PAYMENT (check all that apply)

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☑ Deposit Account Deposit Account Number: 501315 Deposit Account Name: Gordon E. Nelson

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FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims ______ - 20 or HP = Extra Claims ______ x Fee ($) ______ = Fee Paid ($) ______

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims ______ - 3 or HP = Extra Claims ______ x Fee ($) ______ = Fee Paid ($) ______

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims: Fee ($) ______ Fee Paid ($) ______

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets ______ - 100 = Extra Sheets ______ / 50 = Number of each additional 50 or fraction thereof ______ (round **up** to a whole number) x Fee ($) ______ = Fee Paid ($) ______

4. OTHER FEE(S) Fees Paid ($)

Non-English Specification, $130 fee (no small entity discount) ______

Other (e.g., late filing surcharge): Appealment Brief - large entity $500

SUBMITTED BY			
Signature	Gordon E Nelson	Registration No. (Attorney/Agent) 30,093	Telephone 978-948-7632
Name (Print/Type)	Gordon E. Nelson		Date 6/15/2006